



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,590	05/08/2001	Masaaki Usui	SUZ1P001	2619

22434 7590 11/30/2004

BEYER WEAVER & THOMAS LLP  
P.O. BOX 778  
BERKELEY, CA 94704-0778

EXAMINER

GOSHTASBI, JAMSHID

ART UNIT PAPER NUMBER

2637

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/851,590

**Applicant(s)**

USUI, MASA AKI

**Examiner**

Jamshid Goshtasbi-G.

**Art Unit**

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

1. Claims 1-20 are pending in the application.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 5-7, 10-12, 14-16 and 19-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Koga et al. (US 5835529).

As to **Claim 1**, Koga et al. discloses, as part of a MFSK digital communication system, a method for transmitting information via a transmission medium (Figs. 1 and 2; col. 11, lines 45-63; col. 12, lines 19-34) comprising receiving first information represented according to a first number system (the binary transmission information data  $d_t$ ; col. 11, lines 45-46) of a first order (radix 2); converting the first information to second information (based on the block of  $\log_2 M$  of the transmission data code; col. 11, line 51), the second information being represented according to a second number system (the transmission code data  $c_{oo}$  are converted into the 4-bit transmission code data  $s_{po}$  in the serial-to-parallel conversion unit SP; col. 15, lines 11-14) of a second order [radix 16], the

Art Unit: 2637

second order being greater than the first order [radix 16 is larger than radix 2]; representing the second information using a first number of unique signal characteristics (the carrier frequencies to be used cgo are read out from a memory table and are assigned to the block; col. 11, lines 52-55; also, col. 15, lines 11-17), the first number corresponding to the second order (M is an integer and represents the maximum number of carrier frequencies...; col. 11, lines 55-56); and transmitting the second information [M-ary FSK signal] via the transmission medium (transmission signal ot; col. 12, line 34; col. 11, lines 57-63).

**Claim 2** inherits all the limitations of Claim 1. Further, Koga et al. discloses first number system being a binary number system (dt being binary; col. 11, lines 45-46).

**Claim 3** inherits all limitations of Claim 2. Further, Koga et al. discloses that the second number system being a ternary number system (M is an integer not less than 2 and represents the number of carrier frequencies; col. 20, lines 21-23; [i.e., M=3 anticipates the second number system being ternary]).

**Claim 5** inherits all limitations of Claim 2. Further, Koga et al. discloses that the second number system is a hexadecimal number system (Fig. 5; also, col. 37, lines 3-12; Fig. 76A).

**Claim 6** inherits all limitations of Claim 2. Further, Koga et al. discloses the second number system comprising all  $n^{\text{th}}$  order number system where n is greater than or equal to three (M is an integer not less than 2 and represents the number of carrier frequencies; col. 20, lines 21-23; [i.e.,  $M \geq 3$  anticipates  $n \geq 3$ ]).

Art Unit: 2637

**Claim 7** inherits all limitations of Claim 1. Further, Koga et al. discloses that each of the unique signal characteristics comprises a unique frequency (MFSK; Fig.5; col. 15, lines 11-17).

As to **Claim 10**, Koga et al. also discloses a method for receiving information transmitted via a transmission medium (Figs. 1 and 3; col. 11, line 64 – col. 12, line 19; col. 13, lines 7-26) comprising receiving first information via the transmission medium (Figs. 1 and 3; the reception signal or; col. 13, line 32), the first information being represented and transmitted using a first number  $[M]$  of signal characteristics (the transmitted M-ary FSK signal or; col. 11, lines 57-63; col. 12, line 34); converting representation of the first information to a first number system  $[\text{radix } M]$  of a first order (Fig. 6; reception code data  $c_{do}$  corresponding to carrier frequencies; col. 12, line 6; reception code data  $c_{do}$  each for each frequency; col. 14, lines 3-8;), the first order  $[\text{radix}]$  corresponding to the first number ( $M$  of the received M-ary FSK signal); and converting the first information to second information (reception information data  $d_r$ ; col. 12, lines 16-19), the second information being represented according to a second number system (binary; col. 12, line 18) of a second order (radix 2), the second order being less than the first order ( $M$  is an integer not less than 2 and represents the number of carrier frequencies; col. 20, lines 21-23).

**Claim 11** inherits all the limitations of Claim 10. Further, Koga et al. discloses the second number system being a binary number system (binary reception information data  $d_r$ ; col. 12, lines 16-19).

**Claim 12** inherits all limitations of Claim 11. Further, Koga et al. discloses

Art Unit: 2637

the first number system [with radix=M] being a ternary number system (M is an integer not less than 2 and represents the number of carrier frequencies; col. 20, lines 21-23; [i.e., M=3 anticipates the second number system being ternary]).

**Claim 14** inherits all limitations of Claim 11. Further, Koga et al. discloses that first number system is a hexadecimal number system (Fig. 6; also, col. 37, lines 18-21).

**Claim 15** inherits all limitations of Claim 11. Further, Koga et al. discloses the first number system comprising an  $n^{\text{th}}$  order number system where n is greater than or equal to three (M is an integer not less than 2 and represents the number of carrier frequencies; col. 20, lines 21-23; [i.e.,  $M \geq 3$  anticipates  $n \geq 3$ ]).

**Claim 16** inherits all limitations of Claim 10. Further, Koga et al. discloses that each of the unique signal characteristics comprises a unique frequency (MFSK; Fig.6; col. 15, lines 17-; the transmitted M-ary FSK signal of; col. 11, lines 57-63; col. 12, line 34).

As to **Claim 19**, the claimed system for transmitting information via a transmission medium and all its recited features correspond to the subject matter mentioned in the rejection of Claim 1 above, similarly applicable hereto. Furthermore, also discloses the second order [M-ary] being greater than the first order [binary] (M is an integer not less than 2 and represents the number of carrier frequencies; col. 20, lines 21-23).

As to **Claim 20**, the claimed system for receiving information transmitted via a transmission medium and all its recited features correspond to the subject matter mentioned in the rejection of Claim 10 above, similarly applicable hereto.

Art Unit: 2637

Furthermore, Koga et al. also discloses the second order [binary] being less than the first order (M-ary; M is an integer not less than 2 and represents the number of carrier frequencies; col. 20, lines 21-23).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koga et al. (US 5835529) as applied to claims 1 and 10 above, and further in view of Yamao et al. (US 6351498 B1).

As to **Claim 4**, Koga et al. is silent about the second number system being a quaternary number system. In disclosing a digital modulation and demodulation scheme for radio communication based on M-ary modulation and demodulation scheme, however, Yamao et al. teaches a quaternary (4-valued) FSK modulator (Figs. 13, 16, and 18) where the binary information enters the 4-ary FSK modulator of the transmitter and frequencies (f<sub>1</sub>, f<sub>2</sub>, f<sub>3</sub>, f<sub>4</sub>) corresponding to the input data are outputted (col. 8, lines 31-35). Further, the bit sequence entering the modulation unit is converted (encoded) into a quaternary number system (4-valued) for 4-valued frequency modulation (col. 10, lines 5-21). Therefore, it would have been obvious to one of ordinary skill in the art at the time the

Art Unit: 2637

invention was made to incorporate the teachings of Yamao et al. into the method of Koga et al. because it provides for developing the transmitter of the MFSK digital communication system of Koga et al. for a 4-ary FSK communication.

As to **Claim 13**, Koga et al. is silent about the first number system being a quaternary number system. However, Yamao et al. further teaches that in a 4-ary FSK demodulation (Figs. 13, 19), the received 4-ary FSK signal is detected and the four frequencies are represented as values in a quaternary first number system (4-values corresponding to four frequencies) which are then converted to the second (binary) data output (col. 10, lines 22-43). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Yamao et al. into the method of Koga et al. because it provides for developing the receiver of the MFSK digital communication system of Koga et al. for receiving 4FSK signals in a 4-ary FSK communication.

6. Claims 8-9 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koga et al. (US 5835529) as applied to claims 1 and 10 above, and further in view of Sturza et al. (US 6665296 B1).

As to **claims 8-9 and 17-18**, Koga et al. is silent about either the transmission medium comprising a wide area network or at least a portion of the transmission medium comprising telephone transmission lines. In disclosing a network access communication system, however, Sturza et al. teaches that subscribers are connected to a wide area network (WAN) through a local area



Art Unit: 2637

network (LAN), wherein the LAN may be operated through a (PSTN) public switched telephone network (col. 4, line 64 – col. 5, line 5). Furthermore, Sturza et al. also teaches that in order to avoid interference between subscribers, the radio communication link incorporates 16-ary FSK modulation. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Sturza et al. into the method of Koga et al. because it provides for developing a network access communication system (a transmission medium comprising a WAN, with a portion of it (LAN) including public telephone lines) that employs the 16-ary FSK communication link for avoiding interference between subscribers.

***Other prior art cited***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Higuchi (US 6212241 B1) discloses a 4-FSK based digital modulated signal receiver.

Hiben et al. (US 5323125) discloses a frequency agile method for transmitting multi-level data.

Beingauer et al. (US 40054478) discloses a process for representing digital data by binary signals, in which the data are in the form of binary-, ternary-, or higher M-ary-coded characters.

***Contact information***

Art Unit: 2637

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jamshid Goshtasbi-G., whose telephone number is (571) 272-3012. The examiner can normally be reached on M-F 8:00/4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel, can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jamshid Goshtasbi-G.  
Examiner  
Art Unit 2637



JAYANTI PATEL  
SUPERVISORY PATENT EXAMINER